

## CLAIMS

We claim:

1. A method comprising:  
  
gathering run-time capability and preference information for an application, client device and server regarding an application service object; and  
  
directing replication of at least one application service object from the server to the client device based on the client, the server, and the application run-time capability and preference information.
2. The method defined in Claim 1 wherein the client device capability and preference information comprises one or more of processor speed, central processing unit (CPU) processing power, available memory, available power, availability of a just-in-time compiler, down-link network bandwidth, up-link network bandwidth, and round trip time to the server.
3. The method defined in Claim 1 wherein the capability and preference information for the application, the client device and the server comprises one or more of data consistency requirements and latency tolerance levels.

4. The method defined in Claim 1 wherein the server capability and preference information comprises one or more of connectivity of the server and server load changes.

5. The method defined in Claim 1 wherein the run-time capability and preference information for the application, the client device and the server comprises client-specific, application-specific, and server specific cost metrics.

6. The method defined in Claim 1 further comprising:  
for each service request, determining whether to invoke the at least one service object on the server or replicated on the client device using a decision object based on the run-time capability and the preference information.

7. The method defined in Claim 1 further comprising:  
querying a synchronization helper acquired from the preference information to determine when to synchronize application data replicated on the client device with a copy of the application data on the server.

8. The method defined in Claim 7 further comprising querying a synchronization helper acquired from the preference information to determine whether to lock the copy of the application data on the server after synchronization.

9. The method defined in Claim 1 wherein the at least one application service object comprises World Wide Web-related application logic.

10. The method defined in Claim 1 further comprising determining whether the at least one application service object is executable on a server based on the capability and preference information.

11. The method defined in Claim 10 further comprising:  
collecting preference information for the client and the server;  
resolving differences in one or more preferences of the client and the server to determine whether the at least one application service object is to be run on the client device or the server.

12. An article of manufacture having one or more recordable media storing instructions thereon which, when executed by a system, cause the system to:

gather run-time capability and preference information for an application, client device and server regarding an application service object; and

direct replication of at least one application service object from the server to the client device based on the client, the server, and the application run-time capability and preference information.

13. A server comprising:

a network interface for use in communicating to one or more client devices;

a replication system having

preference and capability interfaces to gather run-time capability and preference information for an application, client device and server regarding an application service object; and

a replication manager to direct replication of at least one application service object from the server to the client device based on the client, the server, and the application run-time capability and preference information.

14. A client device comprising:

a network interface for use in communicating to a server;

a client-side replication system having

preference and capability interfaces to gather run-time capability and preference information for a client device regarding an application service object; and

a replication manager to request replication of at least one application service object from the server to the client device based on the run-time capability and preference information.

15. A system comprising:

preference manager;

capability profiler; and

a replication manager, using the preference management information from the preference manager and the capability management information from the capability profiler, to direct replication of a replicable application service object that is part of a replicable service deployed on a server to a client, wherein the replicable application service object handles one or more requests from the client and generates one or more results in response to the one or more requests, and further wherein the replicable application service object has a plurality of replicas.

16. The system defined in Claim 15 wherein the replication manager performs one or more of a group of operations that includes selecting the client, populating the

client with code and data, synchronizing the plurality of replicas and selecting a synchronized replica for serving a request.

17. The system defined in Claim 15 wherein the client device capability and preference information comprises one or more of processor speed, central processing unit (CPU) processing power, available memory, available power, availability of a just-in-time compiler, down-link network bandwidth, up-link network bandwidth, and round trip time to the server.

18. The system defined in Claim 15 wherein the capability and preference information for the application, the client device and the server comprises one or more of data consistency requirements and latency tolerance levels.

19. The system defined in Claim 15 wherein the server capability and preference information comprises one or more of connectivity of the server and server load changes.

20. The system defined in Claim 15 wherein the replicable application service object comprises code, immutable data and mutable data.

21. The system defined in Claim 20 wherein the code comprises class files that define Web-related application logic.

22. The system defined in Claim 17 wherein the mutable data comprises a public fragment and a private fragment.

23. The system defined in Claim 15 wherein the replicable application service object is a client replica.

24. The system defined in Claim 15 wherein the replicable application service object is a server replica.

25. A method comprising:

selecting a client device for replication of a replicable application service object based on capability and preference information of the client device and a server on which the replicable application service object resides;

populating the client device with client-specific data; and

choosing an appropriate replica to serve a service request originally targeted for the server.

26. The method defined in Claim 25 further comprising:

maintaining a desired state consistency among replicas.

27. The method defined in Claim 25 further comprising:

intercepting the service request; and

determining if the client device currently allows replication.

28. A server comprising:

a network interface for use in communicating to one or more client devices;

a replication system having a preference interface; a capability interface; and a replication manager, the replication manager operable to

select a client device for replication of a replicable application service object based on capability and preference information of the client device and a server, via the preference and capability interfaces, on which the replicable application service object resides,

populate the client device with client-specific data by sending the client-specific data via the network interface, and

choose an appropriate replica to serve a service request originally targeted for the server.



29. An article of manufacture having one or more recordable media storing instructions thereon which, when executed by a system, cause the system to:

- select a client device for replication of a replicable application service object based on capability and preference information of the client device and a server on which the replicable application service object resides;
- populate the client device with client-specific data; and
- choose an appropriate replica to serve a service request originally targeted for the server.